UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/706,071	11/03/2000	Leif Wilhelmsson	34650-00605USPT	6691

7590 06/15/2005

Jenkens & Gilchrist PC
1445 Ross Avenue
Suite 3200
Dallas, TX 75202

EXAMINER	
SCHEIBEL, ROBERT C	
ART UNIT	**PAPER NUMBER**
2666	

DATE MAILED: 06/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/706,071	WILHELMSSON ET AL.	
	Examiner	Art Unit	
	Robert C. Scheibel	2666	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 March 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see the second paragraph on page 9, filed 3/15/2005, with respect to the objection to the specification have been fully considered and are persuasive. The objection to the specification has been withdrawn.

2. Applicant's arguments, see the third paragraph on page 9, filed 3/15/2005, with respect to the rejection of claim 1-41 under 35 U.S.C. 112, first paragraph, have been fully considered and are persuasive. The rejection of claims 1-41 under 35 U.S.C. 112, first paragraph, has been withdrawn.

3. Applicant's arguments, see pages 9-10, filed 3/15/2005, with respect to the rejection of claims 1-3, 8-11, 14, 16-17, 21-23, 28-31, 34, and 36-37 under 35 U.S.C. 102(b) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, new grounds of rejection are made in view of U.S. Patent 5,920,597 to Khayrallah et al as indicated below.

4. Applicant's arguments, see pages 10-12, filed 3/15/2005, with respect to the rejection of claims 1-2, 11-13, 21-22, and 31-33 under 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, new grounds of rejection are made in view of U.S. Patent 5,920,597 to Khayrallah et al as indicated below.

5. Applicant's arguments, see page 12, filed 3/15/2005, with respect to the rejection of claims 4-5, 15, 24-25, and 35 under 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration,

new grounds of rejection are made in view of U.S. Patent 5,920,597 to Khayrallah et al as indicated below.

6. Applicant's arguments, see page 12, filed 3/15/2005, with respect to claims 6-7, 26-27, and 41 have been fully considered but they are not persuasive. Clearly, the rejection of claim 41 has been withdrawn as this claim has been cancelled. However, regarding claims 6-7 and 26-27, applicant argues that the combination of Eckhardt and Khayrallah fails to disclose the limitations of parent claims 1 and 21. In particular, applicants argue that Khayrallah fails to teach or suggest determining from an estimated quality condition whether a channel is primarily noise limited or primarily interference limited and selecting a packet type to be transmitted over the channel based on the determination of whether the channel is primarily noise limited or primarily interference limited. However, examiner feels that the combination of Eckhardt and Khayrallah clearly discloses this limitation. Eckhardt clearly discloses determining an estimated channel quality condition as indicated in the previous office action and reiterated below. Eckhardt also clearly discloses changing the packet type (more or less coding and larger or smaller packet sizes) based on this channel condition. See section 6.3 of Eckhardt for more information. Khayrallah also clearly discloses that a noise-limited channel (rather than an interference-limited channel) justifies more error correction coding and thus implies that an interference-limited channel justifies less error correction coding (see lines 57-61 of column 3). Examiner believes the combination of these two references to make the limitation of claims 1 and 21 obvious. In other words, Eckhardt discloses the concept of changing packet types based on a measured channel quality and further indicates that the packet types are distinguished in part by the level of error coding and Khayrallah discloses using more or less error coding if the channel quality is

limited by interference or noise. Thus, as indicated in the rejection below, the combination of Eckhardt and Khayrallah thus disclose the limitations of independent claims 1 and 21 as well as claims 6-7 and 26-27.

7. Applicant's arguments, see page 13, filed 3/15/2005, with respect to the rejection of claims 18-20 and 38-40 under 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, new grounds of rejection are made in view of U.S. Patent 5,920,597 to Khayrallah et al as indicated below.

8. Applicants are encouraged to amend the independent claims to distinguish the claims of the present application from the prior art discussed herein by adding details on what different packet types are used and how the decisions are made to switch between these packet types.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims **1-9, 10-11, 14-17, 21-29, 30-31, and 34-37** are rejected under 35 U.S.C. 103(a) as being anticipated by the paper "Improving Wireless LAN Performance via Adaptive Local Error Control" by Eckhardt et al in view of U.S. Patent 5,920,597 to Khayrallah et al.

Regarding claims **1 and 21**, Eckhardt discloses the step of determining a quality measure in the quality measures of truncation detection and decoder failure discussed in section 6.3 on page 335. The channel quality processor is the 80486 processor described in the third line of section 7.1 on page 335. The step of estimating a quality condition is disclosed in the BIMODAL policy description paragraph found in section 6.3 on page 335 ("...when conditions are good..." and "...when they are poor...") The quality condition is the number of consecutive transactions that are truncated or corrupted. The step of selecting a packet type is disclosed in the third paragraph of section 6.2 on page 334 and in the BIMODAL policy description paragraph of section 6.3 on page 335. The different segment sizes and levels of FEC are the different packet types ("BOLD" or "ROBUST"). The packet type selector is the adaptation policy module described in section 6.2.

Eckhardt does not disclose expressly the limitation of determining from the estimate quality condition whether the channel is noise limited or interference limited or the limitation of basing the packet type selection on whether the channel is noise or interference limited.

Khayrallah teaches using higher coding rates when a channel is noise limited rather than interference limited in lines 57-61 of column 3. Khayrallah also implicitly teaches the converse of this – that lower coding rates are to be used when a channel is more interference limited that

noise limited. Since Eckhardt teaches changing the packet type (the amount of coding) based on the channel quality, this teaching applied to Eckhardt clearly teaches changing the packet type based on whether the channel is noise or interference limited. Clearly, one would have to determine whether the channel is noise or interference limited in order to appropriately change the packet type.

Eckhardt and Khayrallah are analogous art because they are from the same field of endeavor of wireless communications systems.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify Eckhardt to use uncoded packet types when the channel is interference limited (larger number of truncations relative to the decoder failures detected) and use coded packet types when the channel is primarily noise limited (relatively small number of truncations relative to the decoder failures detected.)

The motivation for doing so would have been to improve the efficiency with which the bandwidth is used. This is implied by Khayrallah in lines 55-64 of column 3; the statement that more error correction is justified in primarily noise-limited channels implies that the error correction is more effective in these channel conditions. Conversely, this implies that error correction is less effective in interference-limited channels. Thus, this suggestion would improve the utilization of the channel (only using bandwidth for coding overhead when it is most effective.)

Therefore, it would have been obvious to combine Khayrallah with Eckhardt for the benefit of improved utilization of the channel to obtain the invention as specified in claims 1 and 21.

Regarding claims **2 and 22**, the limitation that at least one quality measure is determined based on information obtained from the receiver is disclosed in the third paragraph of section 6.2 on page 334. The information from the receiver is the "error reports that slaves include in DATA-ACK packets".

Regarding claims **3 and 23**, the limitation that at least one quality measure is determined based on information obtained in the transmitter unit is also disclosed in the third paragraph of section 6.2 on page 334. The information from the transmitter is the masters "own observations".

Eckhardt does not explicitly suggest the limitation of ignoring receiver side measures of claims 4 and 24, the limitation of which quality measure is determined of claims 5 and 25, the limitation of the selected packet type being the same as a previously selected packet type of claims 10 and 30.

Regarding claims **4 and 24**, it would have been obvious to one of ordinary skill in the art to ignore receiver side quality measures. In the third paragraph of section 6.2 on page 334, Eckhardt indicates how the transmitter (master) utilizes both transmitter information (its own observations) and receiver information (error reports) in the adaptation policy module to track the quality of the wireless link. As is obvious to one of ordinary skill in the art, there can be discrepancies between these two independent pieces of information. In this case, it is obvious that a simple method of resolving these differences is by using only one of the two measures when this situation is encountered. The motivation for doing so would have been to provide a simple method of resolving discrepancies between the two independent pieces of information. Therefore, it would have been obvious to modify Eckhardt to ignore receiver information for the

benefit of a simple method of resolving discrepancies to obtain the invention as specified in claims 4 and 24.

Regarding claims **5 and 25**, although Eckhardt doesn't explicitly suggest the limitation of which one of the at least one quality measures depending on a previously selected packet type. However, Eckhardt uses decoder failures as one quality measure (as shown in the description of the FLEX adaptation policy in section 6.3 on page 335). Eckhardt also indicates that based on the channel quality, the transmitter may change the encoding such that the entire block carries user data; in other words, the data is unencoded. It is obvious to one of ordinary skill in the art that this measure (of decoder failure) cannot be used when the signal is not encoded. Thus, although Eckhardt doesn't explicitly suggest determining which quality measure based on the previously selected packet, it is obvious that this must be done to support the unencoded packet type described above. It would be obvious to one of ordinary skill in the art to modify Eckhardt to use either truncation and encoder failure measures or only truncation as quality measures based on the previously selected packet type. That is, only truncation is used when the unencoded packet type is selected and both measures are used when other packet types are selected. The motivation for doing so is to support unencoded packet types. Therefore, it would have been obvious to modify Eckhardt as described above for the purpose of supporting unencoded packet types to obtain the invention as specified in claims 5 and 25.

Regarding claims **6-7 and 26-27**, Eckhardt and Khayrallah disclose all the limitations of parent claims 1 and 21 as discussed above. Eckhardt does not disclose expressly the limitations of using an uncoded packet type when the channel is primarily interference limited (claims 6 and 26) or using a coded packet type when the channel is primarily noise limited (claims 7 and 27).

Khayrallah teaches using higher coding rates when a channel is noise limited rather than interference limited in lines 57-61 of column 3. Khayrallah also implicitly teaches the converse of this – that lower coding rates are to be used when a channel is more interference limited that noise limited. Regarding claims **6 and 26**, the passage cited above discloses the limitation of using uncoded packet types when the channel is interference limited. Regarding claims **7 and 27**, the passage cited above also discloses the limitation of using coded packet types when the channel is noise limited.

Eckhardt and Khayrallah are analogous art because they are from the same field of endeavor of wireless communications systems.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify Eckhardt to use uncoded packet types when the channel is interference limited (larger number of truncations relative to the decoder failures detected) and use coded packet types when the channel is primarily noise limited (relatively small number of truncations relative to the decoder failures detected.)

The motivation for doing so would have been to improve the efficiency with which the bandwidth is used. This is implied by Khayrallah in lines 55-64 of column 3; the statement that more error correction is justified in primarily noise-limited channels implies that the error correction is more effective in these channel conditions. Conversely, this implies that error correction is less effective in interference-limited channels. Thus, this suggestion would improve the utilization of the channel (only using bandwidth for coding overhead when it is most effective.)

Therefore, it would have been obvious to combine Khayrallah with Eckhardt for the benefit of improved utilization of the channel to obtain the invention as specified in claims 6-7 and 26-27.

Regarding claims **8 and 28**, Eckhardt discloses the limitation of selecting a relatively short packet type when the channel has a high bit error rate in both the BIMODAL and BI-SIZE adaptation policies in paragraphs 5 and 6 of section 6.3 on page 335. When packet corruption is detected, these policies reduce the size of the packets.

Regarding claims **9 and 29**, Eckhardt discloses the limitation of selecting a relatively long, uncoded packet type if the channel is neither interference nor noise limited in the description of the BIMODAL adaptation policy. Eckhardt states that this policy behaves exactly like the BOLD policy when conditions are good; the BOLD policy uses maximally sized packets with no error coding.

Regarding claims **10 and 30**, Eckhardt discloses the limitation that the selected packet type is the same as a previously selected packet type in the BIMODAL policy paragraph of section 6.3; the last phrase ("it sends small, heavily-coded packets until three consecutive packets are not damaged") implies that these same "ROBUST" packet type will be selected until three consecutive undamaged packets are detected.

Regarding claims **11 and 31**, Eckhardt discloses the limitation of the selected packet type being different than the previously selected packet type in the paragraph describing the BIMODAL policy of section 6.3 on page 335.

Regarding claims **14 and 34**, Eckhardt discloses the limitation of the estimating step including comparing the quality measure to a predefined value in the BIMODAL policy

paragraph (section 6.3 on page 335). The predefined value in this case is two. If more than two consecutive packets are truncated or corrupted, a particular action is taken.

Eckhardt does not explicitly suggest the limitation of waiting a predefined time period before selecting a packet type of claims 15 and 35.

Regarding claims **15 and 35**, it is well known to one of ordinary skill in the art to use a timer to implement a hysteresis mechanism when automatically varying a particular characteristic in a communications system. It would have been obvious to one of ordinary skill in the art to use a timer to control the frequency at which the packet type is changed. The motivation for doing so would have been to prevent the packet type from rapidly changing back and forth between multiple types when the channel quality measure is near a threshold. Therefore, it would have been obvious to add hysteresis using a timer to the invention of Eckhardt for the purpose of preventing the packet type from rapidly changing to obtain the invention as specified in claims **15 and 35**.

Regarding claims **16 and 36**, Eckhardt discloses the limitation of at least an error detection quality measure being used to estimate the channel condition in the detection of truncations described in section 6.3 on page 335. As described on line 2 of section 3.2 on page 329, truncation is the partial loss of a packet, so detection of packet truncation is clearly an error detection quality measure.

Regarding claims **17 and 37**, Eckhardt discloses the limitation of at least an FEC quality measure (corruption) and an error detection quality measure (truncation) being used in the decoder failures described in the description of the BIMODAL adaptation policy in section 6.3 of page 335.

12. Claims **1-2, 11-13, 21-22, and 31-33** are rejected under 35 U.S.C. 103(a) as being unpatentable over the Bluetooth Core Specification Version 1.0 B (hereinafter referred to as "Bluetooth 1.0 B") in view of U.S. Patent 6,567,375 to Balachandran et al and in further view of U.S. Patent 5,920,597 to Khayrallah et al.

Regarding claims **1 and 21**, Bluetooth 1.0 B discloses all the limitations of these claims in section 3.19 on page 217. In the title of this section ("Channel Quality-Driven Change Between DM and DH") and in lines 1-3, the document clearly indicates that the change between DM and DH is to be driven based on the channel quality. Thus it is inherent that the devices are able to ascertain the channel quality. This anticipates the step of and channel quality processor for determining a quality measure for a channel of said network connection; a channel quality cannot be determined without a quality measure. The channel quality processor of claim 21 for performing this step of determining is anticipated by the processor that implements the link controller (LC) (see lines 7-8 of page 217 "Based upon quality measures in LC"). Further, the step of and channel condition processor for estimating a quality condition are anticipated by the channel quality discussed in this section. The link controller is also the channel quality processor. The step of and packet type selector for selecting a packet type are anticipated by the change between DM and DH packets as discussed in this section. The packet type selector is the link manager (LM).

Bluetooth 1.0 B does not disclose expressly the limitation that a size and a coding of said selected packet type are dependent upon one another. Balachandran discloses the limitation that a size and a coding of said selected packet type are dependent upon one another in throughout

(see title) and in particular in lines 18-57 of column 6. Consider the sentences in lines 18-22 of column 6 which teach that the "best communication" is achieved by using a "more robust coding scheme" when the packet size is small and switching to other coding schemes (understood to be less robust) when the packet size increases. This very clearly teaches the benefit of making the packet size and selected coding scheme dependent upon one another. Bluetooth 1.0 B and Balachandran are analogous art because they are from the same field of endeavor of wireless packet communications systems. At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify Bluetooth 1.0 B to make the selection of coding scheme and packet size dependent upon one another. The motivation for doing so would have been to provide the "best communication" as suggested by Balachandran on lines 18-22 of column 6.

Bluetooth 1.0 B, modified, does not disclose expressly the limitation of determining from the estimate quality condition whether the channel is noise limited or interference limited or the limitation of basing the packet type selection on whether the channel is noise or interference limited.

Khayrallah teaches using higher coding rates when a channel is noise limited rather than interference limited in lines 57-61 of column 3. Khayrallah also implicitly teaches the converse of this – that lower coding rates are to be used when a channel is more interference limited that noise limited. Since Bluetooth 1.0 B, modified, teaches changing the packet type based on the channel quality, this teaching applied to Bluetooth 1.0 B, modified, clearly teaches changing the packet type based on whether the channel is noise or interference limited. Clearly, one would

have to determine whether the channel is noise or interference limited in order to appropriately change the packet type.

Bluetooth 1.0 B, modified, and Khayrallah are analogous art because they are from the same field of endeavor of wireless communications systems.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify Bluetooth 1.0 B, modified, to use uncoded packet types when the channel is interference limited (larger number of truncations relative to the decoder failures detected) and use coded packet types when the channel is primarily noise limited (relatively small number of truncations relative to the decoder failures detected.)

The motivation for doing so would have been to improve the efficiency with which the bandwidth is used. This is implied by Khayrallah in lines 55-64 of column 3; the statement that more error correction is justified in primarily noise-limited channels implies that the error correction is more effective in these channel conditions. Conversely, this implies that error correction is less effective in interference-limited channels. Thus, this suggestion would improve the utilization of the channel (only using bandwidth for coding overhead when it is most effective.)

Therefore, it would have been obvious to combine Khayrallah with Balachandran and Bluetooth 1.0 B for the benefit of providing the best communication to obtain the invention as specified in claims 1 and 21.

Regarding claims **2 and 22**, the limitation of the quality measure being determined from a receiver side is indicated in Sequence 45 and Sequence 46 on page 217. The receiver (the

right-hand device) sends an LMP_preferred_rate message to the transmitter (the left-hand device) when the quality measure indicates that a change of packet type is required.

Regarding claims **11 and 31**, the limitation of the selected packet type being different from a previously selected packet type is anticipated by the change between DM and DH packet types (see the title of section 3.19 and the description in the main paragraph of page 217) which are clearly different.

Regarding claims **12 and 32**, the limitation of the network being an ad hoc network is anticipated by the fact that this document defined the Bluetooth standard which is defined for use in ad hoc networks as is well known in the art.

Regarding claims **13 and 23**, the limitation that the network is a Bluetooth wireless network is anticipated by the title of the document.

13. Claims **18-20 and 38-40** are rejected under 35 U.S.C. 103(a) as being unpatentable over the paper "Improving Wireless LAN Performance via Adaptive Local Error Control" by Eckhardt et al in view of U.S. Patent 5,920,597 to Khayrallah et al and in further view of U.S. Patent 5,701,294 to Ward et al.

Eckhardt, modified, discloses all the limitations of the parent claims 1 and 21 as described in the rejection according to 35 U.S.C. 103(a) above.

Eckhardt, modified, does not disclose expressly the limitation of claims 18 and 38 of at least a received signal strength and error detection quality measure are used. Further, Eckhardt does not disclose expressly the limitations of at least a packets positively acknowledged and power amplifier voltage are used to estimate the channel condition (claims 19 and 39) or the

limitation of these measure being based partly on at least one of error detection, FEC, or signal strength quality measure (claims 20 and 40).

Regarding claims **18 and 38**, Ward discloses estimating the channel quality based on signal strength (SS) and error detection (BER) in lines 49-54 of column 8.

Regarding claims **19 and 39**, Ward discloses the limitation of estimating the channel quality based on a positive packets acknowledged in the BER from lines 49-54 of column 8. It is well known in the art that one means for estimating the bit error rate of a channel is based on the acknowledgements received in a typical ARQ error detection scheme. The limitation of the channel condition being estimated based on the power amplifier voltage is disclosed in lines 8-28 of column 5 of Ward. The last two sentences indicate that if the signal strength is less than a threshold when the system is operating at maximum power, the call will be handed off or dropped. This clearly indicates that the power of the transmitter is used in the determination of the channel condition (since, as is well known, the channel condition is used to determine when to handoff or drop calls).

Regarding claims **20 and 40**, the limitation that the positively acknowledged packets quality measure and the power amplifier voltage are based partly on at least one of the error detection quality measure, FEC quality measure, and RSSI quality measure is disclosed in lines 8-28 of column 5. This passage links the transmitter power level and the signal strength in the determination of the channel condition. If the signal strength is less than a threshold, the power level is then evaluated to make a determination on the condition of the channel.

Eckhardt, modified, and Ward are analogous art because they are from same field of endeavor of detecting channel quality in wireless systems.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify Eckhardt to use signal strength, bit error rate, and transmitter power level to ascertain the channel quality.

The motivation for doing so would have been to more accurately measure channel quality by using more of the potential network conditions that may affect quality (as suggested in lines 24-29 of column 8).

Therefore, it would have been obvious to combine Ward with Eckhardt and Khayrallah for the benefit of more accurate channel quality estimates to obtain the invention as specified in claims 18-20 and 38-40.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent 6,084,865 to Dent discloses the use of error coding when a channel is noise limited versus interference limited.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert C. Scheibel whose telephone number is 571-272-3169. The examiner can normally be reached on Monday and Thursday from 6:30-5:00 Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema S. Rao can be reached on 571-272-3174. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RCS 6-13-05

Robert C. Scheibel
Examiner
Art Unit 2666

DANG TON
PRIMARY EXAMINER